

Figure 1: Schematic representation of the RNA genome of the tobacco etch virus. The main diagram shows a linear RNA molecule with segments labeled H, B, S, E, 5Sm, K, and H. Segment lengths are indicated: H (4.5), B (4.0), S (4.2), E (3.0), 5Sm (3.0), K (3.0), and H (5.5). A scale bar indicates 0.8. An inset shows a detailed view of the 3' end with segments K, H, and H, with a length of 0.75.

1 GTT AGC TCT TCG TAT ACG ATA TTG GAT ACA CTA AAT TTC GAT TTG GTC TAG GGC ACC CCT CCA GCG ACG GGC GAA ATG GGC 84

85 TAG CCA TGC CCA TAG TAG GAC TAG CAA ACG GAG GGA CTA GCC CTA GTG GCG AGC TCC CTG GGT CTA AGT GCT GAG TAC AGG 168

169 ACA CTC GTC AGT AGT TCG ACG TGA CCA CTA GCC CAC CTC GAG ATG CTA CGT CGA CGA GGC CAT GGC CAA GAC ACA CCT TAA CCC 252

253 TGG CGG GGG TCG CTA GGG TGA AAT CAC ATT ATG TGA TGG GGG TAC GAC CTG ATA GGG TGC TGC AGA GGC CCA CTA GCA GGC TAG 331

337 TAT AAA AAT CTC TGC TOT ACA TGG CAC ATG GAG TTG AAT CAT TTT GAA TTA TTA TAC AAA ACA AGC AAA CAA CAA CCA ATG GGA 420

421 GTG GAG GAA CCG GTG TAT GAC ACC GCG GGA CCA CTA TTT GGG AAC CCA AGT GAG CAC CCA CCA TCA ACG CTG AAG CTG 477

505 CCA CAC GAC ACG GGG AGA GGA GAT ATC AGA ACA CTA GGG GAC CTA CCC AGG AAA GGT GAC TOT AGG AGT GGC AAC CAT CTA 588

589 GGC CCG GGT AGT GGG ATA TAC ATA AAG CCC GGC CCT GTC TAC TAT CAG GAC TAC ACG GGC CTA GTC TAT CAC AGA GGT CCT TTA 672

76 GCT Pro Val Ser Gly Ile Tyr Ile Tyr Ile Lys Pro Gly Pro Val Tyr Tyr Gln Asp Tyr Thr Gly Pro Val Tyr Lys Arg Ala Pro Lys 101

673 GAG TTC TTT GAT CAG GCC CAG TTC TGC GAG GTG ACT AAG AGA ATA GGC AAG GTC ACG GGT AGT GGT AAG CTT TAC CAC ATA 156

104 Gln Phe Phe Asp Gln Ala Gln Phe Cys Gln Val Thr Lys Arg Ile Gly Arg Val Thr Gly Ser Asp Gly Lys Lys Tyr Lys Ile 131

757 TAT GTG TGC GTC GAT GGT TGC ATA CTG CTA AAA TTA GGC AAA AGG GGC ACA CCC AGA ACC CTA AAG TGG ATT AGG AAC TTC ACC 840

132 Tyr Val Cys Val Asp Gly Cys Ile Leu Leu Lys Leu Ala Lys Arg Gly Thr Pro Arg Thr Leu Lys Tyr Ile Arg Ala Phe Thr 159

841 AAC TGT CCA TTA TGG GTA ACC AGT TGC TCC GAT GAC GGC GCA AGT GGC AGC AAG GAT AAG CCA GAC AGA ATG AAC AAA GGT 924

160 Asn Cys Pro Leu Tyr Val Thr Ser Cys Ser Asp Asp Gly Ala Ser Gly Ser Lys Asp Lys Pro Asp Arg Met Asn Lys Gly 187

925 AAG TTG AAG ATA GCC CCA AGA GAG CAT GAG AAG GAC AGC AAG ACC AAG CCT CCT GAT CCA ACG ATT GTA GAG GGA GTA AAA 1008

188 Lys Leu Lys Ile Ala Pro Arg Gln His Gln Lys Asp Ser Lys Thr Lys Pro Pro Asp Ala Thr Ile Val Val Gln Val Lys 215

1009 TAC CAA ATC AAA AAG AAA GGC AAA GTC AAA GGG AAG AAC ACA CAA GAC GGC CTG TAC CAT AAT AAG AAC CCA CCA GAG TCC 1092

216 Tyr Gln Ile Lys Lys Lys Gly Lys Val Lys Gly Lys Asn Thr Gln Asp Gly Leu Tyr His Asn Lys Asn Lys Pro Pro Gln Ser 243

1093 AGG AAG AAA CTA GAA GCC CTG TTG GCG GCG ATA ACA ATC TTG CTG TAC CAG CCT GTA GCA GCC GAG AAC ATA ACT 1171
244 Arg Lys Lys Leu Glu Lys Ala Leu Leu Ala Trp Ala Val Ile Thr Ile Leu Leu Tyr Glu Pro Val Ala Ala Glu Asn Ile Thr 271

1177 GAA TGG AAC CTG AGT GAC AAC GCC ACT AAT CGT ATT CAG CGA GCC ATG TAT CTT AGA GCG GTT AAC AGG AGC TTA CAT GGG ATC 1261
272 Glu Trp Asn Leu Ser Asp Asn Gly Thr Asn Gly Ile Glu Arg Ala Met Tyr Leu Arg Gly Val Asn Arg Ser Leu His Gly Ile 299

1261 TGG CCC GAG AAA ATA TGC AAG GGG GTC CCC ACT CAT CTG GCC ACT GAC AGC GAA CTG AAA GAG ATA CGC GCG ATG ATG GAT GCC 1314
300 Trp Pro Glu Lys Ile Cys Lys Gly Val Pro Thr His Leu Ala Thr Asp Thr Glu Leu Lys Glu Ile Arg Gly Met Met Asp Ala 327

1345 AGC GAG AGG ACA AAC TAT ACG TGT AGG TTA GAA AGA CAT GAA TGG AAC AAA CAT GGA TGG TGT AAC TGG TAC AAC ATA GAC 1428
328 Ser Glu Arg Thr Asn Tyr Thr Cys Arg Lys Leu Glu Arg His Glu Trp Asn Lys His Gly Trp Cys Asn Trp Tyr Asn Ile Asp 355

1429 CCT TGG ATT CAG TTA ATG AAC AGG ACC CAA ACA AAT TGG ACA GAA GGC CCT CCA GAT AAG GAG TGT GCC ACC TGC AGG TAT 1512
356 Pro Trp Ile Glu Leu Met Asn Arg Thr Glu Thr Asn Leu Thr Glu Gly Pro Pro Asp Lys Glu Cys Ala Val Thr Cys Arg Tyr 383

1513 GAC AAA AAT ACC GAT GTC AAC GTG GTC ACC CAG GCC AGG AAT AGG CCA ACT ACT CTG ACT GGC TGC AAG AAA GGG AAA AAC TTT 1596
384 Asp Lys Asn Thr Asp Val Asn Val Val Thr Glu Ala Arg Asn Arg Pro Thr Thr Leu Thr Gly Cys Lys Gly Lys Asn Pro 411

1597 TCA TTC GCA GGC ACA GTC ATA GAG GGC CCG TGC AAT TTC AAC GTT TCC GTG GAG GAC ATC TTA TAC GGA GAC CAT GAG TGT GCG 1680
412 Ser Phe Ala Gly Thr Val Ile Glu Gly Pro Cys Asn Phe Asn Val Ser Val Glu Asp Ile Leu Tyr Gly Asp His Glu Cys Gly 439

1681 AGT CTG CTC CAG GAC ACG GCT CTG TAC CTA TTA GAT GGA ATG ACC AAC ACT ATA GAG AAT GCC AGG CAA GGT GCG GCG GTG 1764
440 Ser Leu Leu Glu Asp Thr Ala Leu Tyr Leu Leu Asp Gly Met Thr Asn Thr Ile Glu Asn Ala Arg Glu Gly Ala Ala Arg Val 467

1765 ACA TCT TGG CTT GGG AGG CAG CTC AGT ACC GCA GGG AAG AAG CTA GAG AGG AGA AGC AAA ACC TGG TTT GGT GCG TAT GCC CTG 1848
468 Thr Ser Trp Leu Gly Arg Glu Leu Ser Thr Ala Gly Lys Lys Leu Glu Arg Arg Ser Lys Thr Trp Phe Gly Ala Tyr Ala Leu 495

1849 TCA CCT TAC TGC AAT GTG ACT AGA AAA ATA GGG TAC ATA TGG TAT ACA AAC TGC ACC CCG GCA TGC CTC-CCT AAG AAC ACA 1932
496 Ser Pro Tyr Cys Asn Val Thr Arg Lys Ile Gly Tyr Ile Trp Tyr Thr Asn Asn Cys Thr Pro Ala Cys Leu Pro Lys Asn Thr 523

1933 AAA ATA ATA GGC CCT GGA AAG TTT GAC ACC AAT GCG GAA GAC GGG AAG ATC CTT CAT GAA ATG GGG GCG CAC CTA TCA GAA TTT 2016
524 Lys Ile Ile Gly Pro Gly Lys Phe Asp Thr Asn Ala Glu Asp Gly Lys Ile Leu His Glu Met Gly Gly His Leu Ser Glu Phe 551

2017 TTG TTG CTT TCT CTA GTT ATC CTG TCT GAT TTT GCC CCC GAG ACA GCT AGC ACG CTA TAC CTA ATT TTA CAC TAT GCA ATC CCC 2100
582 Leu Leu Leu Ser Leu Val Ile Leu Ser Asp Phe Ala Pro Glu Thr Ala Ser Thr Leu Tyr Leu Ile Leu His Tyr Ala Ile Pro 579

2101 CAG TCC CAC GAA CCT GAT AGC AAC CAA CTT AAC CTA ACA GTG AAA CTT AGG ACA GAA GAC GTA GTG CCA TCA 2184
580 Gln Ser His Glu Glu Pro Glu Gly Cys Asp Thr Asn Gln Leu Asn Leu Thr Val Lys Leu Arg Thr Glu Asp Val Val Pro Ser 607

2185 TCA GTT TGG AAT ATT GGC AAA TAT GTT GTT AGA CCA GAC TGG TGG CCG TAT GAA ACT AAA GTG GCT CTG GTG TTT GAA GAG 2268
608 Ser Val Trp Asn Ile Gly Lys Tyr Val Cys Val Arg Pro Asp Trp Trp Pro Tyr Glu Thr Lys Val Ala Leu Leu Phe Glu Glu 635

2269 GCA GGA CAG GTT ATA AAG CTA GTC CTA CGG GCA CTG AGG GAT TTA ACT AGG GTC TGG AAC AGC GCA TCA ACT ACT GCG TTT CTC 2352
636 Ala Gly Gln Val Ile Lys Leu Val Leu Arg Ala Leu Arg Asp Leu Thr Arg Val Trp Asn Ser Ala Ser Thr Thr Ala Phe Leu 663

2353 ATT TGC TTG ATA AAA GTA TTG AGA GGA CAG GTT GTG CAA GGT ATA ATA TGG CTG CTG ACC GGG GCA CAA GGG GCG CTA 2436
664 Ile Cys Leu Ile Lys Val Leu Arg Gly Gln Val Val Gln Gly Ile Ile Trp Leu Leu Leu Val Thr Gly Ala Gln Gly Arg Leu 691

2437 GCC TGT AAG GAA GAC TAC AGG TAT GCG ATC TCG TCA ACC AAT GAG ATA GGG CTG GCG GCT GAA GGT CTC ACC ACT ACC TCG 2520
692 Ala Cys Lys Glu Asp Tyr Arg Tyr Ala Ile Ser Ser Thr Asn Glu Ile Gly Leu Leu Gly Ala Gly Leu Thr Thr Thr Trp 719

2521 AAA GAA TAC AGC CAC GGT TTG CAG CTG GAC GAC GGA ACC GGT AAG GCG CTC TGC ACT GCA GGG TCC TTT AAA GTC ACA GCA CTT 2604
720 Lys Glu Tyr Ser His Gly Leu Glu Leu Asp Asp Gly Thr Val Lys Ala Val Cys Thr Ala Gly Ser Phe Lys Val Thr Ala Leu 747

2605 AAC GTG GTT AGT AGG AGG TAT CTA GCA TCA TTG CAC AAG AGG GGT CTA CCC ACC TCA GTG ACA TTT GAG CTC CTA TTT GAC GGG 2688
748 Asn Val Val Ser Arg Arg Tyr Leu Ala Ser Leu His Lys Arg Ala Leu Pro Thr Ser Val Thr Phe Glu Leu Leu Phe Asp Gly 775

2689 ACC AAC CCA ACA ATC GAG GAG ATG GA* GAT GAC TTC GGA TTT GGG CTG TGC CCA TTT GAC AGC AGT CCT GTG ATC AAA GGG AAG 2772
776 Thr Asn Pro Ala Ile Glu Glu Met Asp Asp Phe Phe Gly Lys Cys Pro Phe Asp Thr Ser Pro Val Ile Lys Gly Lys 803

2773 TAC AAC ACC ACT TTG TTA AAC GGC AGT GCT TTC TAT CTA GTC TGC CCA ATA GGA TGG ACT GGT GTC GTA GAG TGC ACA GCA GTG 2856
804 Tyr Asn Thr Thr Leu Leu Asn Gly Ser Ala Ile Tyr Leu Val Cys Pro Ile Gly Trp Thr Gly Val Val Glu Cys Thr Ala Val 831

2857 AGC CCC ACA ACC TTG AGA ACA GAA GTG GTG AAA ACC TTC AGG AGA GAT AAG CTT TTT CCA CAT AGA GTA GAC TGT GTG ACC ACC 2940
832 Ser Pro Thr Thr Leu Arg Thr Glu Val Val Lys Thr Phe Arg Arg Asp Lys Pro Phe Pro His Arg Val Asp Cys Val Thr Thr 859

2941 ATA GTA GAA AAA GAC CTA TTC CAT TGC AAG TTG GGG GGT AAT TGG ACA TGT GTA AAA GGC GAC CCA GTG ACT TAT AAG GGG 3024
860 Ile Val Glu Lys Glu Asp Leu Phe His Cys Lys Leu Gly Gly Asn Trp Thr Cys Val Lys Gly Asp Pro Val Thr Tyr Lys Gly 887

3025 GGG CAA GTA AAG CAG TGC AGG TGG TGT GGT TTC GAG TTT AAA GAG CCC TAC GGG CTC CCA CAC TAC CCG ATA GGC AAG TGC ATC 3108
888 Gly Gln Val Lys Gln Cys Arg Trp Cys Gly Phe Glu Phe Lys Glu Pro Tyr Gly Leu Pro His Tyr Pro Ile Gly Lys Cys Ile 915

1109 CTA ACA AAT GAG ACA GGT TAC AGG GTA GTA CAT TCC ACA GAC TGC AAC ACA GAT GGC CTC GTT ATT AGC ACT GAA GGG GAA CAT 319
916 Leu Thr Asn Glu Thr Gly Tyr Arg Val Val Asp Ser Thr Asp Cys Asn Arg Asp Gly Val Ile Ser Thr Glu Gly Glu His 943

1193 GAG TGC TTG ATT GGC AAC ACT ACC GTC AAG GTG CAT GCA CTG CAT GAA ACA TTG GGC CCT ATG CCG TGC AGA CCC AAA GAA ATC 327
944 Glu Cys Leu Ile Gly Asn Thr Thr Val Lys Val His Ala Leu Asp Glu Arg Leu Gly Pro Met Pro Cys Arg Pro Lys Glu Ile 971

1272 GTC TCT AGT GAG GGA CCT GTG AGG AAA ACT TCT TGT ACA TTC AAC TAC ACA AAG ACT CTA AGA AAC AAA TAC TAT GAG CCC AGA 336
977 Val Ser Ser Glu Gly Pro Val Arg Lys Thr Ser Cys Thr Phe Asn Tyr Thr Lys Thr Leu Arg Asn Lys Tyr Tyr Glu Pro Arg 999

1361 GAC AGT TAC TTC CAG CAA TAT ATG CTC AAG GGC GAG TAT CAA TAC TGG TTT AAT CTG GAC GTG ACC GAC CAC ACA GAC TAC 344
1000 Asp Ser Tyr Phe Glu Gln Tyr Met Leu Lys Gly Glu Tyr Gln Tyr Thr Phe Asn Leu Asp Val Thr Asp His His Thr Asp Tyr 1037

1445 TTT GCC GAG TTT GTT GTC TTG GTA GTA GTA GCA CTG TTA GGA GGA AGG TAC GTT CTG TGG CTA ATA GTG ACC TAC ATA ATT CTA 3528
1028 Phe Ala Glu Phe Val Val Leu Val Val Val Ala Leu Leu Glu Gly Arg Tyr Val Leu Thr Phe Val Thr Tyr Ile Val Thr Tyr 1055

1529 ACA GAG CAG CTC GCT GCT CTA CAG CTA GGC CAG GGT GAG GTG GTA TTG ATA GGG AAC CTA ATT ACC CAC ACQ GAC AAT GAG 3612
1056 Thr Glu Gln Leu Ala Ala Gly Leu Gln Leu Glu Gly Gln Gly Val Val Leu Ile Gly Asn Leu Ile Thr His Thr Asp Asn Glu 1083

1613 GTG GTG TAC TTC CTA CTG CTC TAC TTA GTA ATA AGA GAT GAG CCC ATA AAG AAA TGG ATA CTA CTG CTG TTT CAT GCA ATG 3696
1084 Val Val Val Tyr Phe Leu Leu Leu Tyr Leu Val Ile Arg Asp Glu Pro Ile Lys Lys Tyr Ile Leu Leu Leu Phe His Ala Met 1111

1697 ACT AAC AAT CCA GTC AAC ACC ATA ACA GTA GCA TTG CTA ATG ATC AGT GGG GTT GCC AAG GGT GGT AAG ATA GAT GAT GGT GGC TGG 3740
1112 Thr Asn Asn Pro Val Lys Thr Ile Thr Val Ala Leu Leu Met Ile Ser Gly Val Ala Lys Gly Gly Lys Ile Asp Gly Gly Tyr 1139

1781 CAG AGA CAA CCG GTG ACC AGT TTT GAC ATC CAA CTC GCA CTG GCA GTC GTA GTC GTT GTG ATG TTG CTG GCA AAG AGA GAC 3864
1140 Gln Arg Gln Pro Val Thr Ser Phe Asp Ile Gln Leu Ala Leu Val Val Val Val Val Met Leu Leu Ala Lys Arg Asp 1167

1865 CCG ACT ACT TTC CCT TTG GTA ATC ACA GTG GCA ACC CTG AGA GGC GGC AAG ATA ACC AAG GGT TTT AGC ACA GAT CTA GTC ATA 3948
1168 Pro Thr Thr Pro Leu Val Ile Thr Val Ala Thr Leu Arg Thr Ala Lys Ile Thr Asn Gly Phe Ser Thr Asp Leu Val Ile 1195

1949 GCC ACA GTG TCG GCA GCT TTG TTA ACT TGG ACC TAT ATC AGC GAC TAC TAC AAA TAC AAG ACT TGG CTA CAG TAC CTC GTC AGC 4032
1196 Ala Thr Val Ser Ala Ala Leu Leu Thr Thr Thr Tyr Ile Ser Asp Tyr Tyr Lys Tyr Thr Thr Thr Thr Thr Thr Thr Thr Thr Thr 1223

4033 ACG GTG ACT GGA ATC TTC CTG ATA AAG GTG CTG AAG GGA ATA GGC GAA TTG GAT CTO GAC GCC CCA ACC TTG CCG TCT CAC AGA 4116
1224 Thr Val Thr Gly Ile Phe Leu Ile Arg Val Leu Lys Gly Ile Gly Glu Leu Asp Leu His Ala pro Thr Thr Leu Pro Ser His Arg 1251

4117 CCC CTC TTT TAC ATC CTT GTA TAC CTT ATT TGC ACT CCC GTG GTA ACT AGA TGG AAT CTG GAC GTA GCC GGA TGG TTT GTG CAG 4200
1233 Pro Leu Phe Tyr Ile Leu Val Tyr Leu Ile Ser Thr Ala Val Val Thr Arg Trp Ann Leu Asp Val Ala Gly Leu Leu Leu Gln 1279

4201 TGC GTC CCA ACT CTT TTA ATG GTT TTT ACG ATG TGG GCA GAC AAT CTC ACC CTA ATT CTC ATA CTA CTT ACT TAT GAG TTA ACA 4284
1280 Cys Val Pro Thr Leu Leu Met Val Phe Thr Met Trp Ala Asp Ile Leu Thr Leu Ile Leu Ile Leu Pro Thr Tyr Gln Leu Thr 1307

4285 AAG TTA TAC TAC CTT AAG GAA GTG AAG ATT GGG GCA GAA AGA GGT TGG CTG TGG AAA ACT AAC TAT AAG AGG GTA AAC GAC ATC 4368
1308 Lys Leu Tyr Tyr Leu Lys Gln Val Lys Ile Gly Ala Gln Arg Gly Trp Leu Trp Lys Thr Ann Tyr Lys Arg Val Asp Asp Ile 1335

4369 TAC GAG GTC GAC CAA ACT AGC GAA GGG GTT TAC CTT TTC CTT TCT TCT AAA CAG AGG AGC GGT ATA ACT AGT ACC AGT TGG CCA 4452
1336 Tyr Gln Val Asp Gln Thr Ser Gln Gly Val Tyr Lys Phe Pro Ser Lys Gln Arg Thr Ser Ala Ile Thr Ser Thr Met Leu Pro 1363

4453 TTA ATC AAA GCC ATA CTC ATT AGC TGC ATC AGC AAC AAG TGG CAA CTC ATA TAC TTA CTC TAC TGG ATA TTT GAA GTG TCT TAC 4536
1364 Leu Ile Lys Ala Ile Leu Ile Ser Cys Ile Ser Ann Lys Trp Gln Leu Ile Tyr Leu Leu Tyr Leu Ile Phe Gln Val Ser Tyr 1391

4537 TAC CTC CAC AAG AAA GTT ATA GAT GAA ATA GCT GGT GGG ACC AAC TTC TCA AGG CTC GTG GCG GCT TTT ATT GAA GTC AAT 4620
1392 Tyr Leu His Lys Lys Val Ile Asp Gln Ile Ala Gly Gly Thr Ann Phe Val Ser Arg Leu Val Ala Ala Leu Ile Gln Val Ann 1419

4621 TGG GCC TTC GAC AAT GAA GTC AAA GGC TTA AAG AAG TTC TTT CTG TCT AGT AGG GTC AAA GAG TTT ATC ATC AAA CAC 4704
1420 Trp Ala Phe Asp Asn Gln Gln Val Lys Gly Leu Lys Phe Phe Leu Leu Ser Ser Arg Val Lys Gln Leu Ile Ile Lys His 1447

4705 AAA GTG AGG AAT GAA GTA GTG GTC CCG TGG TTT GGA GAT GAA GAG ATT TAT GGG ATG CCA AAG CTG ATC GGC TTA GTT AAG GCA 4788
1448 Lys Val Arg Asn Gln Val Val Val Arg Trp Phe Gly Asp Gln Ile Tyr Gly Met Pro Lys Leu Ile Gly Leu Val Lys Ala 1475

4789 GCA ACA CTA AGT AGA AAC AAA CAC TGT ATG TTT GGT ACC GTC TGT GAG GAC AGA GAT TGG AGA GGG GAA ACT TGC CCT AAA TGT 4872
1476 Ala Thr Leu Ser Arg Asn Lys His Cys Met Leu Cys Thr Val Cys Gln Asp Arg Asp Trp Arg Gly Gln Thr Cys Pro Lys Cys 1503

4873 GGG CGT TTT GGA CCA CCA GTG GTC GGT ATG ACC CTA GCC GAT TTC GAA GAA AAA CAC TAT AAA AGG ATT TTC ATT AGA GAG 4956
1504 Gly Arg Phe Gly Pro Pro Val Val Cys Gly Met Thr Leu Ala Asp Phe Gln Gln Lys His Tyr Lys Arg Ile Phe Ile Arg Gln 1531

4957 GAC CAA TCA GCG GCG CCA CTT AGG GAG GAG CAT GCA GGG TAC TTT CAG TAC AAA GCC AGG GGT CAA CTG TTT TTT AGG AAC CTC 5040
1532 Asp Gln Ser Gly Gly Pro Leu Arg Gln Gln His Ala Gly Tyr Leu Gln Tyr Lys Ala Arg Gly Gln Leu Phe Leu Arg Ann Leu 1559

5041 CCA GTG TTA GCT ACA AAA GTC AAG ATG CTC GTT GGT AAC CTC GGG ACA GAG ATT GGG GAT CTG GAA CAC CTT GCG TGG GTG 5124
1560 Pro Val Leu Ala Thr Lys Val Lys Met Leu Leu Val Gly Asn Leu Gly Thr Gln Ile Gly Asp Leu Gln His Leu Gly Trp Val 1587

5125 CTT AGA GGG CCA GCT GTT TGC AAG AGT ACT GAA CAC GAA AGA TGC ACC AGC TCT ATA ATG GAT AAG TTG ACT GCT TTC TTT
1588 Leu Arg Gly Pro Ala Val Cys Lys Lys Val Thr Glu His Glu Arg Cys Thr Thr Ser Ile Met Asp Lys Leu Thr Ala Phe Phe
5209 GGA ATA ATG CCA AGG GGC ACT ACT CCC AGA GCT CCC GTA AGA TTC CTT ACC TGC CTA AAG ATA AGA AGA GGG CTG GAG ACT
1616 Gly Val Met Pro Arg Gly Thr Thr Pro Arg Ala Pro Val Arg Phe Pro Thr Ser Leu Leu Lys Ile Arg Arg Gly Leu Glu Thr
5293 GGT TGG GCT TAC ACA CAC GAA GGT GGC ATC AGC TCA GTA CAC CAT GTC ACT TGT GGG AAA GAC TTA CTG GTG TGT GAC ACC ATG
1644 Gly Trp Ala Tyr Thr His Glu Gly Ile Ser Ser Val Asp His Val Thr Cys Gly Lys Asp Leu Leu Val Cys Asp Thr Met
5377 GGT CGG ACA AGG GTT GTT TGC CAG TCA AAT AAT AAG ATG ACC GAC TGC GAA TAC GGA GTC AAA ACT GAC TCC GGG TGC CCA
1672 Gly Arg Thr Arg Val Val Cys Glu Ser Asn Asn Lys Met Thr Asp Glu Ser Glu Tyr Gly Val Lys Thr Asp Ser Gly Cys Pro
5461 GAG GGA GGC AGG TGT TAC GTG TTT AAC CCG GAA GCA GTT AAC TCA GGC ACT AAA GGA GGC ATG GTC CAC TTA CAG AAA AGC
1700 Glu Gly Ala Arg Cys Tyr Val Phe Asn Pro Glu Ala Val Asn Ile Ser Gly Thr Lys Gly Ala Met Val His Leu Glu Lys Thr
5545 GGT GGA GAA TTC ACC TGT GTG ACA GCA TCA GCA ACC CCG GCT TTC TTT GAC CTC AAG AAC CTT AAG GGC TGG TCA GGG CTA CCG
1728 Gly Gly Glu Phe Thr Cys Val Thr Ala Ser Gly Thr Pro Ala Phe Asp Leu Lys Asn Leu Lys Gly Trp Ser Gly Leu Pro
5629 ATA TTT GAA GCA TCA AGT GGA AGG GTA GTC GGA AGG GTC AAG GGC AAG AAC GAG GAT TCC AAA CCA ACC AAG CTC ATG AGT
1756 Ile Phe Glu Ala Ser Ser Gly Arg Val Val Gly Arg Val Lys Val Gly Lys Asn Glu Asp Ser Lys Pro Thr Lys Leu Met Ser
5713 GGG ATA CAA ACG GTT TCT AAA AGC GGC ACA GAC TCG AGG GTG AAG ATA ACG ACC ATG AAC AGG GGA GAG TTC AGA
1784 Gly Ile Glu Thr Val Ser Lys Ser Ala Thr Asp Leu Thr Glu Met Val Lys Lys Ile Thr Thr Met Asn Arg Gly Glu Phe Arg
5797 CAA ATA ACC CTG GCC ACA GGT GCC GGA AAA ACT ACA GAG CTC CTT AGA TCA GAT ATA GAA GAG ATA GGG AGG CAT AAG AGG GTG
1812 Glu Ile Thr Leu Ala Thr Gly Ala Gly Lys Thr Thr Glu Leu Pro Arg Ser Val Ile Glu Glu Ile Gly Arg His Lys Arg Val
5881 TTG GTC TTA ATC CCC TTG AGG GCG GCA GCA GCA TCA GTA TAC CAA TAC ATG AGA CAA CAT CCG AGT ATA GCA TTC AAT CTA
1840 Leu Val Leu Ile Pro Leu Arg Ala Ala Glu Ser Val Tyr Glu Tyr Met Arg Glu Lys His Pro Ser Ile Ala Phe Asn Leu
5965 AGG ATA GGT GAG ATG AAG GAA GGT GAT ATG GCC AGG GGA ATA ACC TAT GCC TCT TAC GGT TAC TTT TGC CAG ATG TCA CAA CCC
1868 Arg Ile Gly Glu Met Lys Glu Gly Asp Met Ala Thr Gly Ile Thr Tyr Ala Ser Tyr Gly Tyr Phe Cys Glu Met Ser Glu Pro
6049 AAG CTG AGA GCC GCA ATG GTA GAA TAT TCC TTT ATA TTC CTA GAT GAG TAT CAT TGT GCT ACC CCA GAA CAA CTG GCA ATC ATG
1896 Lys Leu Arg Ala Met Val Glu Tyr Ser Phe Ile Phe Leu Asp Glu Tyr His Cys Ala Thr Pro Glu Leu Ala Ile Met

6131 GGG AAG ATC CAC AGA TTC TCA GAA AAC CCG GTG GTA GCT ATG ACG ACA CCG GCA GCA ACA ACT GGG CAG 6211
1924 Gly Lys Ile His Arg Phe Ser Glu Asn Leu Arg Val Val Ala Met Thr Ala Thr Pro Ala Gly Thr Val Thr Thr Gly Gln 1931

6217 AAA CAC CCT ATA GAG GAA TTT ATA GCC CCG GAA GTG ATG AAA GGA GAC TTG GGT TCT GAG TAC TTA GAT ATT GCC GGA CTG 6301
1932 Lys His Pro Ile Glu Glu Phe Ile Ala Pro Glu Val Met Lys Gly Glu Asp Leu Gly Ser Glu Tyr Leu Asp Ile Ala Gly Leu 1939

6301 AAG ATA CCA GTA GAG GAG ATG AAG AAT AAC ATG CTA GTT TTT GTG CCC ACC AGG AAC Met Ala Val Phe Val Thr Arg Asn Met Ala Val Glu Ala Ala Lys Lys Leu 6384
1980 Lys Ile Pro Val Glu Glu Met Lys Asn Asn Met Leu Val Phe Val Thr Arg Asn Met Ala Val Glu Ala Ala Lys Lys Leu 2007

6385 AAG GCC AAA GGA TAC AAG TCG GGC TAC TAC AAC GGA GAG CCA TCT AAC CTG AGG GTG AGC TCG TCC CCA TAC 6468
2008 Lys Ala Lys Gly Tyr Asn Ser Gly Tyr Tyr Ser Gly Glu Asp Pro Ser Asn Leu Arg Val Val Thr Ser Gln Ser Pro Tyr 2035

6469 GTG GTG GTA GCA ACC AAC GCA ATA GAA TCG GGC GTT ACC CTC CCG GAC CTG GAC GTG GTT GTC GAC ACG GCA CTC AAG TGT GAA 6552
2036 Val Val Val Ala Thr Asn Ala Ile Glu Ser Gly Val Thr Leu Pro Asp Leu Asp Val Val Val Asp Thr Gly Leu Lys Cys Glu 2063

6553 AAA AGA ATC CGA CTG TCA CCC AAG ATG CCT TTC ATA GTG ACG GGC CTG AAA AGA ATG GCC ATC ACT ATT GGG GAA CAA GCC CAG 6636
2064 Lys Arg Ile Arg Leu Ser Pro Lys Met Pro Phe Ile Val Thr Gly Leu Lys Arg Met Ala Val Thr Ile Gly Glu Gln Ala Gln 2091

6637 AGA AGA GGG AGG GTT GGA AGA GTG AAG CCC GGG AGA TAC TAC AGG AAT CAA GAA ACA CCT GTC GGC TCT AAA GAC TAC CAT TAT 6720
2092 Arg Arg Gly Arg Val Gly Arg Val Lys Pro Gly Arg Tyr Tyr Arg Ser Gln Glu Thr Pro Val Gly Ser, Lys Asp Tyr His Tyr 2119

6721 GAC TTA TTG CAA GCC CAG AGG TAC GGC ATA GAA GAT GGG ATA AAT ATC ACC AAA TCC TTC AGA GAG ATG AAC TAC GAC TGG AGC 6804
2130 Asp Leu Leu Glu Ala Gln Arg Tyr Gly Ile Glu Asp Gly Ile Asn Ile Thr Lys Ser Phe Arg Glu Met Asn Tyr Asp Trp Ser 2147

6805 CTT TAT GAG GAA GAT AGC CTG ATG ATC ACA CAA CTG GAA ATC CTC AAC CCG TTG ATA TCA GAA GAG CTG CCG ATG GCA GTA 6888
2148 Leu Tyr Glu Glu Asp Ser Leu Met Ile Thr Gln Leu Glu Ile Leu Asn Asn Leu Leu Ile Ser Gln Glu Leu Pro Met Ala Val 2175

6889 AAA AAT ATA GTG GCC AGG ACC GAC CAC CCA GAA CCA ATT CAA CTC GCG TAT AAC AGC TAC GAG ACA CAG GTG CCG GTA TTA TTC 6972
2176 Lys Asn Ile Met Ala Arg Thr Asp His Pro Glu Pro Ile Gln Leu Ala Tyr Asn Ser Tyr Glu Thr Gln Val Pro Val Leu Phe 2203

6973 CCA AAA ATA AGA AAT GGA GAG GTG ACT GAT ACT TAC ACC TTC CTC AAT GCA AGA AAA TTG GGA GAT GAT GCA CCC 7056
2204 Pro Lys Ile Arg Asn Gly Glu Val Thr Asp Thr Tyr Asp Asn Tyr Thr Phe Leu Asn Ala Arg Lys Leu Gly Asp Asp Val Pro 2231

7057 CCC TAC GTG TAT GCT ACA GAG GAT GAG TCG GAA CTG TTG GGC CTA GAT TGG CCG GAC CCA GGA AAC CAA GGC ACC 7140
2232 Pro Tyr Val Tyr Ala Thr Glu Asp Glu Asp Leu Ala Val Glu Leu Leu Gly Leu Asp Trp Pro Asp Pro Gly Asn Gln Gly Thr 2259

7141 GTG GAA GCT GGC AGA GCA CTA AAA CAG GTG GTT GGT CTA TCA ACA GAG AAC GGC CTG CTA GTC GGC CTG TTC GGC TAC GTG 7221
2260 Val Glu Ala Gly Arg Ala Leu Lys Glu Val Val Gly Leu Ser Thr Ala Glu Asn Ala Leu Val Ala Leu Phe Gly Tyr Val 2261

7225 GGG TAC CAG GCG CTT TCA AAG AGA CAT ATA CCA GTG GTC ACA GAT ATA TAT TCA GTA GAA GAT CAC AGG CTA GAG GAC ACT ACC 7301
2288 Gly Tyr Glu Ala Leu Ser Lys Arg His Ile Pro Val Val Thr Asp Ile Tyr Ser Val Glu Asp His Arg Leu Glu Asp Thr Thr 2289

7309 CAC CTA CAG TAT GCT CCG AAT GGC AAT GGC AGC GAG GGG AAG GAG ACT GAA TTG AAG GTG GCT CAG GGG GAT GTG CAG AGA 7392
2316 His Leu Glu Tyr Ala Pro Asn Ala Ile Lys Thr Glu Gly Lys Thr Glu Thr Glu Lys Glu Lys Glu Val Asp Val Glu Arg 2317

7393 TGT GTG GAA GCA GTG ACC AAT TAT GCG AGA GAG GGC ATC CAA TTC ATG AAG TCG CAG GCA CTG AAA GTG AGA GAA ACC CCT ACC 7476
2344 Cys Val Glu Ala Val Thr Asn Tyr Ala Arg Glu Gly Ile Glu Phe Met Lys Ser Glu Ala Leu Thr Asp Ser Lys Glu Asp Ile Lys 2371

7477 TAT AAA GAG ACA ATG AAC ACC GTG GCA GAT TAT GTG AAA AAG TTT ATT GAG GCA CTG AGC AAG AAG GAA GAC ATC ATT AAA 7560
2372 Tyr Lys Glu Thr Met Asn Thr Val Ala Asp Tyr Val Lys Phe Ile Glu Ala Leu Thr Asp Ser Lys Glu Asp Ile Lys 2399

7561 TAT GGG CTG TGG GCA CAT ACC GCA TTG TAT AAG AGC ATT GGT GGC AGG CTT GGT CAC GAA ACC GCG TTC GCA ACT CTA GTT 7644
2400 Tyr Gly Leu Trp Gly Ala His Thr Ala Leu Tyr Lys Ser Ile Gly Ala Arg Leu Gly His Glu Thr Asp Leu Val Val Tyr Tyr Ile Ile 2437

7645 GTG AAG TGG TTG GCA TTT GGG GGG GAG TCA ATA TCA GAC CAC ATA AAG CAA JCG GCG ACA GAC TCG GTG GTC TAT TAC ATT ATT 7728
2428 Val Lys Trp Leu Ala Phe Gly Gly Glu Ser Ile Ser Asp His Ile Lys Glu Ala Ala Thr Asp Leu Val Val Tyr Tyr Ile Ile 2455

7729 AAC AGA CCT CAA TTC CCA GGA GAC ACA GAA CAA GAA GGG AGA AAA TTT GTT GGC AGC CTG CTA GTC TCA GCT CTA GCG 7812
2456 Asn Arg Pro Glu Phe Pro Gly Asp Thr Glu Thr Glu Glu Gly Arg Lys Phe Val Ala Ser Leu Leu Val Ser Ala Leu Ala 2483

7813 ACT TAT ACA TAC AAG AGC TGG AAC TAC AAT AAT CTG TCC AAA ATA GTT GAA CCG GCT TTG GCT ACC CTG GCG TAT GCG GCT AAA 7896
2484 Thr Tyr Thr Tyr Lys Ser Trp Asn Tyr Asn Asn 'au Ser Lys Ile Val Glu Pro Ala Leu Ala Thr Leu Pro Tyr Ala Ala Lys 2511

7897 GCG CTC AAG CTA TTT GCT CCT ACC CGA CTG GAG AOC GTT GTC ATA CTG AGC ACT GCA ATC TAC AAA ACA TAC CTA TCA ATA AGG 7980
2512 Ala Leu Lys Leu Phe Ala Pro Thr Arg Leu Glu Ser Val Val Ile Leu Ser Thr Ala Ile Tyr Lys Thr Tyr Leu Ser Ile Arg 2539

7981 CGA GGC AAA AGT GAT GGT CTG CTA GGT ACA GGG GTT AGC GCG GCG ATT ATG TCA CAA AAC GCA GTA TCT GTG GGT ATA 8064
2540 Arg Gly Lys Ser Asp Gly Leu Leu Gly Thr Gly Val Ser Ala Ala Met Glu Ile Met Ser Glu Asn Pro Val Ser Val Gly Ile 2567

8065 GCA GTT ATG CTA GGG GTA GGG GCT GTA GCA GCG CAC AAT GCA ATT GAA GCG AGT GAG CAA AAA AGA ACA CTA CTT ATG AAA GTC 8148
2568 Ala Val Met Leu Gly Val Gly Ala Val Ala His Asn Ala Ile Glu Ala Ser Glu Glu Lys Arg Thr Leu Leu Met Lys Val 2595

8149 TTT GTG AAA AAC TTC TTA GAC CAG GCC ACC GAC GAA CTA GTC AAA GAG AGC CCT GAG AAA ATA ATA ATG GCT TTG TTC GAA 821
 2396 Phe Val Lys Asn Phe Leu Asp Gln Ala Ala Thr Asp Glu Leu Val Lys Glu Ser Pro Glu Lys Ile Ile Met Ala Leu Phe Glu 262
 8233 GCG GTG CAA ACG GTG GGC AAC CCT CTT AGA TTA GTG TAC CAC CTC TAT GGA GTT TTC TAT AAA GCG TGG GGA GCA AAA GAG TTG 831
 2624 Ala Val Gln Thr Val Gly Asn Pro Leu Arg Leu Val Tyr His Leu Tyr Gly Val Phe Tyr Lys Gly Trp Glu Ala Lys Glu Leu 265
 8317 GCC CAA AGA ACA GCC AGC AAC CTT TTC ACC TTG ACC Leu Leu Thr Leu Ile Met Phe Glu Ala Val Gln CTA GGA GTA GAC AGT GAG GGA AAA 840
 2652 Ala Gln Arg Thr Ile Met Gly Asn Lys Phe Thr Leu Ile Met Phe Glu Ala Val Gln CTA GGA GTA GAC AGT GAG GGA AAA 2679
 8401 ATT CCG CAG CTA TCG AGC AAT TAC ATA CTA GAG CTC TTG TAT AAG TTC CGC GAG AAT ATC AAG TCT AGT GTG AGG GAG ATA GCA 8484
 2680 Ile Arg Gln Leu Ser Ser Asn Tyr Ile Leu Glu Leu Leu Tyr Lys Phe Arg Asn Ile Lys Ser Ser Val Arg Glu Ile Ala 2707
 8485 ATC AGC TGG GCC CCC CTT TTT AGT TGC GAT TGG ACA CCA ACA GAT GAC AGA ATA GCG CTT CCC CAT GAC AAT TAC CTC CGA 8568
 2708 Ile Ser Trp Ala Pro Ala Pro Phe Cys Asp Trp Thr Pro Thr Asp Asp Arg Ile Gly Leu Pro His Asn Tyr Leu Arg 2735
 8569 GTG GAG ACA AAG TGC CCC TGT GGT TAC AGC ATG AAA AAG CCG GTA AAA AAC TGC GCT GGG GAG TTG AGA CTT CTG GAG GAA GCG GGT 8652
 2736 Val Glu Thr Lys Cys Pro Cys Gly Tyr Arg Met Lys Ala Val Lys Asn Cys Ala Gly Glu Leu Arg Leu Leu Glu Gly Gly 2763
 8653 TCA TTC CTC TGC AGA AAT AAA TTC GGT AGA GGC TCA CAA AAC TAC AGG GTG ACA AAA TAC TAT GAT GAC AAT TTA TCA GAA ATA 8736
 2764 Ser Phe Leu Cys Arg Asn Lys Phe Gly Arg Gly Ser Gln Asn Tyr Arg Val Thr Lys Tyr Tyr Asp Asn Leu Ser Ser Glu Ile 2791
 8737 AAA CCA GTG ATA AGA ATG GAA GGA CAC GTG GAA CTG TAT TAC AAG GCG CCT ATC AAA CTG GAT TTT AAC AAC AGT AAA ACG 8820
 2792 Lys Pro Val Ile Arg Met Glu Gly His Val Glu Leu Tyr Tyr Lys Gly Ala Thr Ile Lys Leu Asp Phe Asn Ser Lys Thr 2819
 8821 GTA CTG GCA ACT GAC AAA TGG GAG GTT GAC CAC TCC ACC CTG GTT AGG GCA CTC AAG AGG TAC ACA GCG CCT GGA TAT CGA GCG 8904
 2820 Val Leu Ala Thr Asp Lys Trp Glu Val Asp His Ser Thr Leu Val Arg Ala Leu Lys Arg Tyr Thr Gly Ala Gly Tyr Arg Gly 2847
 8905 GCG TAT TTG GGT GAG AAA CCT AAC CAT AAA CAT CTG ATA CAG AGA GAC TGT GCA ACG ATT ACC AAA GAC AAG GTC TGC TTC ATC 8948
 2848 Ala Tyr Leu Gly Glu Lys Pro Asn His Lys His Leu Ile Gln Arg Asp Cys Ala Thr Ile Thr Lys Asp Lys Val Cys Phe Ile 2875
 8949 AAA ATG AAG AGA GCG TGT GCG TTC ACT TAT GAC CTA TCC CTC CAC AAC CTT ACC CCG CTA ATC GAA TTG GTA CAC AAG AAT AAC 9072
 2876 Lys Met Lys Arg Gly Cys Ala Phe Thr Tyr Asp Leu Ser Leu His Asn Leu Thr Arg Leu Ile Glu Leu Val His Lys Asn Asn 2903
 9071 CTG GAA GAT AGA GAA ATC CCT GCT GGT GCG GTT ACA ACC TGG CTG GCG TAC ACA TTT GTG AAT GAA GAC ATA GCG ACC ATA AAA 9156
 2904 Leu Glu Asp Arg Glu Ile Pro Ala Val Thr Val Thr Thr Trp Leu Ala Tyr Thr Phe Val Asn Glu Asp Ile Gly Thr Ile Lys 2931
 9157 CCA ACT TTT GCG GAA AAG GTG ACA CCG GAG AAA CAG GAG GAG GTA GTC TTG CAG CCT GCT GTG GTG GAC ACA ACA GAT GTA 9240
 2932 Pro Thr Phe Gly Glu Lys Val Thr Pro Glu Lys Gln Glu Val Val Leu Gln Pro Ala Val Val Asp Thr Thr Asp Val 2959

9241 GCC GTG ACC GTG GTA GGG GAA ACC TCT ACT ATG AAT ACA GGG GAG ACC CCG ACA ACA TTT ACC AGC TTA GGT TCG GAC TCG AAG 9324
2860 Ala Val Thr Val Val Gly Glu Thr Ser Thr Met Thr Thr Gly Glu Thr Thr Thr Thr Thr Ser Ser Ser Ser Lys 2867

9325 GTC CGA CAA GTC CTG AAG CTG GGC GTG GAC GAT GGT CAA TAC CCC GGG CCT AAT CAG CAG ACA GCA AGC CTG CTC GAA GCT ATA 9408
2888 Val Arg Gln Val Leu Lys Leu Gly Val Asp Asp Gly Gln Tyr Pro Gly Pro Ala Gln Gln Arg Ala Ser Leu Leu Glu Ala Ile 3015

9409 CAA GGT GTG GAT GAA AGG CCC TCG GTA CTG ATA CTG GGG TCT GAT AAG GCC ACC TCC AAT AGG GTC AAG ACC GCA AAG AAT GTG 9492
3016 Gln Gly Val Asp Glu Arg Pro Ser Val Leu Ile Leu Gly Ser Asp Lys Ala Thr Ser Asn Arg Val Lys Thr Ala Lys Asn Val 3043

9493 AAG ATA TAT AGG AGC AGC GAC CCC CTG GAA CTG AGA GAA ATG ATG AAA AGG GGA AAT CTA GTC GTA GCC TTG TCT AGA GTC 9576
3044 Lys Ile Tyr Arg Ser Arg Asp Pro Leu Glu Leu Arg Glu Met Met Lys Arg Gly Lys Ile Leu Val Val Ala Leu Ser Arg Val 3071

9577 GAT ACC GCT CTG GAA TTC GTT GAT TAC AAA GGC ACC TTC CTG ACC AGA GAG ACC CTA GAG GCA TTA AGT CTG GGT AAG CCT 9660
3072 Asp Thr Ala Leu Leu Lys Phe Val Asp Tyr Lys Gly Thr Phe Leu Thr Arg Glu Thr Leu Glu Ala Leu Ser Leu Gly Lys Pro 3099

9661 AAG AAA AGA GAC ATA ACT AAA GCA GCA GCA TGG CTG CTG CCG CTC GAA GAC CAA ATA GAA GAG CTG CCT GAC TGG TTC GCA 9744
3100 Lys Lys Arg Asp Ile Thr Lys Ala Glu Ala Gln Trp Leu Leu Arg Leu Glu Asp Gln Ile Glu Glu Leu Pro Asp Trp Phe Ala 3127

9745 GCC AAG GAA CCC ATA TTT CTA GAA GCC AAC ATT AAA GGT GAC AAG TAT CAC CTG GTA GGG GAC ATA GCC ACT ATT AAA GAA AAA 9828
3128 Ala Lys Glu Pro Ile Phe Leu Glu Ala Asn Ile Lys Arg Asp Lys Thr Lys Leu Val Gly Asp Ile Ala Thr Ile Lys Glu Lys 3155

9829 GCC AAA CAA CTG GGG GCA ACA GAC TCC ACA AAG ATA TCA AAG GAG GTT GCG AAA GTG TAT TCT ATG AAG CTG AGT AAC TGG 9912
3156 Ala Lys Gln Leu Gly Ala Thr Asp Ser Thr Lys Ile Ser Lys Glu Val Gly Ala Lys Val Tyr Ser Met Lys Leu Ser Asn Trp 3183

9913 GTG ATA CAA GAA GAG AAT AAA CAA GGC AGC CTT GCC CCC CTG TTT GAA GAG CTC CAA CAG TGC CCA CCC GGG GGC CAG AAC 9996
3184 Val Ile Gln Glu Glu Asn Lys Gln Gly Ser Leu Ala Pro Leu Phe Glu Leu Leu Gln Cys Pro Pro Gly Gly Gln Asn 3211

9997 AAA ACC ACA CAT ATG GTC TCA GCC TAC CAA GCT CAA GGG AAT TGG GTG CCA GTT AGT TGC CAC GTG TTC ATG GGG ACC ATA 10080
3212 Lys Thr Thr His Met Val Ser Ala Tyr Gln Leu Ala Gln Gly Asn Trp Val Pro Val Ser Cys His Val Phe Met Gly Thr Ile 3238

10081 CCC GCC AGA AGA ACC AAG ACT CAT CCT TAT GAG GCA TAC GTT AAG CTG AAG GAG TCG GTA GAT GAA CAT AAG ATG AAG GCA TTA 10164
3240 Pro Ala Arg Arg Thr Lys Thr His Pro Tyr Glu Ala Tyr Val Lys Leu Arg Glu Leu Val Asp Glu His Lys Met Lys Ala Leu 3267

10165 TGT GGC GGA TCA GGC CTA AGT AAG CAC AAC GAA TGG GTA ATT GGC AAG GTC AAG TAT CAA GGA AAC CTG AGG ACC AAA CAC ATG 10248
3268 Cys Gly Gly Ser Gly Leu Ser Lys His Asn Glu Trp Val Ile Gly Lys Val Lys Tyr Gln Gly Asn Leu Arg Thr Lys His Met 3295

10149 TTG AAC CCC GGA AAG GTG GCG GAG CAA CTG CAC AGA GAA GGG TAC AGG CAC AAT GTG TAT /AT AAG ACA ATA GGT TCA GTG ATG 101
1296 Leu Asn Pro Gly Lys Val Ala Glu Gln Leu His Arg Gly Tyr Arg His Asn Val Tyr Asn Lys Thr Ile Gly Ser Val Met 332

10131 ACA GCA ACT GGT ATC AGG CTG GAG AAG TTA CTT GTG GTT AGG GCG CAA ACA GAC ACA ACC AAC TTC CAC CAA GCA ATA AGG GAT 101
1324 Thr Ala Thr Gly Ile Arg Leu Glu Lys Leu Pro Val Val Arg Ala Gln Thr Asp Thr Thr Asn Phe His Gln Ala Ile Arg Asp 333

10417 AAA ATA GAC AAG GAG GAG AAC CTA CAG ACC CTT GGC TTG CAT AAG AAG TTA ATG GAA GTC TTC AAT GCA TTA AAA AGA CCC GAG 10500
1352 Lys Ile Asp Lys Glu Glu Asn Leu Gln Thr Pro Gly Leu His Lys Leu Met Glu Val Phe Asn Ala Leu Lys Arg Pro Glu 3379

10501 CTT GAG GCC TCT TAT GAC GCT GTG GAT TGG GAG GAA TTG GAG AGA GGA ATA AAT AGG AAG GGT GCT GCT GCT TTC TTC GAA CCC 10586
1380 Leu Glu Ala Ser Tyr Asp Ala Val Asp TTP Glu Glu Lys Asn Lys Val Glu Glu Val Ile Asp Ser Leu Lys Lys Gly Ala Ala Gly Phe Phe Glu Arg 3407

10585 AAG AAC ATA GGA GAG GTT TTG GAT TCG GAA AAA AAT AAA GTC GAA GAG GTT ATT GAC AAT TTG AAA AAA GGT AGG AAT ATC AGA 10668
1408 Lys Asn Ile Gly Glu Val Leu Asp Ser Glu Lys Asn Lys Val Glu Glu Val Ile Asp Ser Leu Lys Lys Gly Arg Asn Ile Arg 3435

10669 TAC TAC GAA ACT GCA ATC CCG AAA AAC GAG AAG AGG GAT GTC AAT GAT GAC TGG ACC GGT GGT GAC TTC GTA GAT GAG AAG AAG 10752
1436 Tyr Tyr Glu Thr Ala Ile Pro Lys Asn Glu Lys Arg Asp Val Asn Asp Asp Thr Thr Ala Gly Asp Phe Val Asp Glu Lys Lys 3463

10753 CCA AGA GTG ATA CAA TAC CTT GAG GCT AAA ACT AGG TTG GCT ATT ACT AAG GTA ATG TAC AAG TGG GTC AAA CAG AAG CCA GTT 10836
1464 Pro Arg Val Ile Gln Tyr Pro Glu Ala Lys Thr Arg Leu Ala Ile Thr Lys Val Met Tyr Lys Trp Val Lys Gln Lys Pro Val 3491

10817 GTC ATA CCG GGT TAT GAA GGT AAG ACA CCC CTG TTT CAA ATT TTT GAC AAA GTG AAG AAA GAA TGG GAT CAA TTC CAA AAC CCT 10920
1492 Val Ile Pro Gly Tyr Glu Gly Lys Thr Pro Leu Phe Gln Ile Phe Asp Lys Val Lys Lys Glu Trp Asp Gln Phe Gln Asn Pro 3519

10921 GTG GCA GTT AGC TTT GAT ACC AAA GCG TGG GAT ACC CAG GTA ACC ACA AGG GAT TTG GAG CTA ATA AGG GAT ATA CAG AAG TTC 11004
1520 Val Ala Val Ser Phe Asp Thr Lys Ala Trp Asp Thr Thr Thr Arg Asp Leu Glu Leu Ile Arg Asp Ile Gln Lys Phe 3547

11005 TAT TTT AAA AAG AAA TGG CAC AAA TTC ATT GAC ACC CTA ACC AAG CAC ATG TCA GAA GTC ATA GTC AAT GGT GAC GAG GAG 11088
1548 Tyr Phe Lys Lys Lys Trp His Lys Phe Ile Asp Thr Leu Thr Lys His Met Ser Glu Val Pro Val Ile Ser Ala Asp Gly Glu 3575

11089 GTA TAC ATA AGG AAA GGT CAG AGA GGC AGT GGG CAA CCT GAC AGC AGC GCA GGC AAC AGC ATG TTG AAT GTG TCG ACA ATG GTG 11172
1576 Val Tyr Ile Arg Lys Gly Gln Arg Gly Ser Glu Glu Pro Asp Thr Ser Ala Gly Asn Ser Met Leu Asn Val Leu Thr Met Val 3603

11173 TAT GCC TTC TGC GAG GCC AGG GGA CCC TAC AAG AGT TTT GAC AGA GTG GCA AAG ATC CAT GTC TGC GCG GAT GAT GGT TTC 11256
1604 Tyr Ala Phe Cys Glu Ala Thr Gly Val Pro Tyr Lys Ser Phe Asp Arg Val Ala Lys Ile His Val Cys Gly Asp Asp Gly Phe 3631

11237 CTG ATT ACC GAA AGA GCT CTC GGT GAG AAA TTT GCG AGT AAA GGA GTC CAG ATC CTA TAC GAA GCT GGG AAG CCT CAA AAG ATC 11
1632 Leu Ile Thr Gln Arg Ala Leu Gly Gln Lys Phe Ala Ser Lys Gly Val Gln Ile Leu Tyr Gln Ala Gly Lys Pro Gln Lys Ile 36
11341 ACT GAA GGG GAC AAG ATG AAA GTA CCC TAT CAG TTT GAT GAT ATC GAG TTC TGC TCC CAT ACA CCA GTA CAA GTG AGG TGG TCA 11
1660 Thr Gln Gly Asp Lys Met Lys Val Ala Tyr Gln Phe Asp Asp Ile Gln Phe Cys Ser His Thr Pro Val Gln Val Arg Tyr Ser 11
11425 GAC AAT ACT TCC AGC TAC ATG CCG GGA AGG AAC AGC ACT ACA ATC CTG GCT AAA ATG CCT ACA AGG TTG GAT TCC AGT GGT GAG 11
1688 Asp Asn Thr Ser Tyr Met Pro Gly Arg Asn Thr Thr Thr Ile Leu Ala Lys Met Ala Thr Arg Leu Asp Ser Ser Gly Gln 11
11509 AGG GGT ACT ATA GCA TAT GAG AAG GCA GTG CCG TTC AGC TTT TTG TTG ATG TAC TCC TGG AAC CCA CTG ATC AGA AGG ATA TCC 11
1716 Arg Gly Thr Ile Ala Tyr Gln Lys Ala Val Ala Phe Ser Phe Leu Leu Met Tyr Ser Tyr Asn Pro Leu Ile Arg Ile Cys 11
11593 TTA CTG GTG TTG TCA ACT GAG TTG CAA GTG AGA CCA GGG AAG TCA ACC ACC TAT TAC TAT GAA GGG GAC CCA ATA TCC GCT TAC 11
1744 Leu Leu Val Leu Ser Thr Gln Leu Gln Val Arg Pro Gly Lys Ser Thr Thr Tyr Tyr Gln Gly Asp Pro Ile Ser Ala Tyr 11
11677 AAG GAA GTC ATT GGC CAC AAT CTC TTT GAC CTT AAA AGA ACA AGC TTC GAA AAG CTA GCA AAG TTA AAT CTC AGC ATG TCC ACG 11
1772 Lys Gln Val Ile Gly His Asn Leu Phe Asp Leu Lys Arg Thr Ser Phe Gln Lys Leu Ala Lys Leu Asn Leu Ser Met Ser Thr 11
11761 CTC GGG GTG TGG ACT AGA CAC ACT AGC AAG AGA TTA CTA CAA GAT TGT GTC AAT GGT GGC ACC AAA GAG GGC AAC TGG CTG GTC 11
1800 Leu Gly Val Tyr Thr Arg His Thr Ser Lys Arg Leu Leu Gln Asp Cys Val Asn Val Gly Thr Lys Gln Gly Asn Tyr Leu Val 11
11845 AAT GCA GAC AGA CTA GTG AGT AGT AAG ACA GGA AAG AGC AGC AGC CAC CAC CCA CCA CCA CCA CCA CCA CCA CCA CCA CCA 11
1824 Asn Ala Asp Arg Arg Leu Val Ser Ser Lys Thr Gly Asn Arg Tyr Ile Pro Gly Gln Gly His Thr Leu Gln Gly Lys His Tyr Gln 11
11929 GAA CTG ATA CTG GCA AGG AAA CCG ATC GGT AAC TTT GAA GGG ACC GAT AGG TAT AAC TTG GGG CCA ATA GTC AAT GTA GTG TTG 11
1856 Gln Leu Ile Leu Ala Arg Lys Pro Ile Gly Asn Phe Gln Gly Thr Asp Arg Tyr Asn Leu Gly Pro Ile Val Asn Val Val Leu 11
12013 AGG AGA CTA AAA ATT ATG ATG GGC CTG ATA GGA AGG GGG GTG TGA GCA TGG TGG GGC CTT GAT CCG GGC CTA CCA GAA 12096
1884 Arg Arg Leu Lys Ile Met Met Ala Leu Ile Gly Arg Gly Val End 1899
12097 CCC TAT TGT AAA TAA CAT TAA CTT ATT AAT TAT TTA GAT ACT ATT TAT TAT TTT TTT TTT TTT TTT TTT TTT TTT TTT TTT 12180
12181 GTA CAA ACT ACC TCA TGT TAC CAC ACT ACA CTC ATT TTA ACA GCA CTT TAT TAT TAT TAT TAT TAT TAT TAT TAT TAT TAT 12264
12265 TAA GGT AAT TTC CTA ACG GC 12284

Figure 3. Nucleotide sequence.

HCV

AGTGACAACGGCACTAATGGTATTCAGCGAGCCATGTATCTTAGAGGGGTAAACAGG
AGCTTACATGGGATCTGGCCCGAGAAAATATGCAAGGGGGTCCCCACTCATCTGGCC
ACTGACACGGAACTGAAAGAGATACGCGGGATGATGGATGCCAGCGAGAGGACAAAC
TATACGTGCTGTAGGTTACAAAGACATGAATGGAACAAACATGGATGGTGTAACTGG
TACAACATAGACCCTTGGATTTCAGTTAATGAACAGGACCCAAACAAATTGACAGAA
GGCCCTCCAGATAAG

Deduced amino acid sequence.

HCV S D N G T N G I Q R A M Y L R G V N R S
L H G I W P E K I C K G V P T H L A T D
T E L K E I R G M M D A S E R T N Y T C
C R L Q R H E W N K H G W C N W Y N I D
P W I Q L M N R T Q T N L T E G P P D K

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Figure 4

